(No Model.)

S. V. B. ESSICK.

ELECTRIC TELEGRAPHIC APPARATUS.

No. 454,338. Patented June 16, 1891.

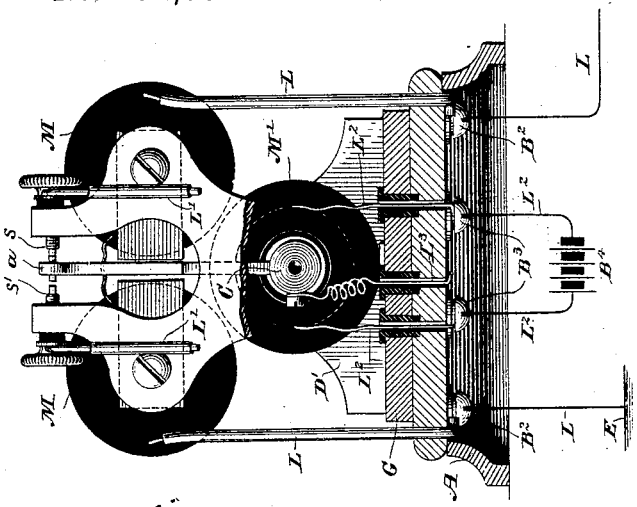

Fig. 2.

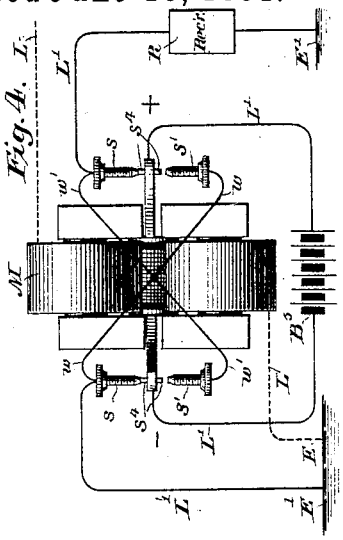

Fig. 4.

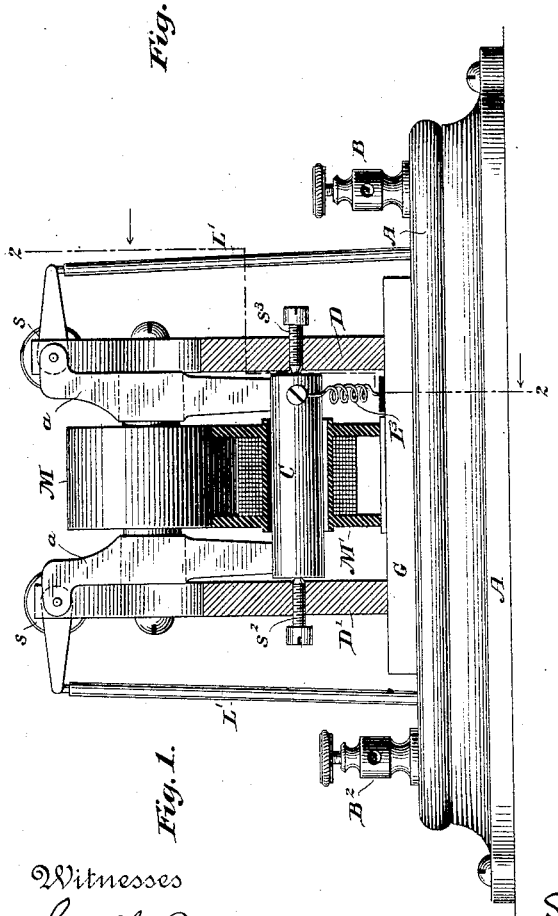

Fig. 1.

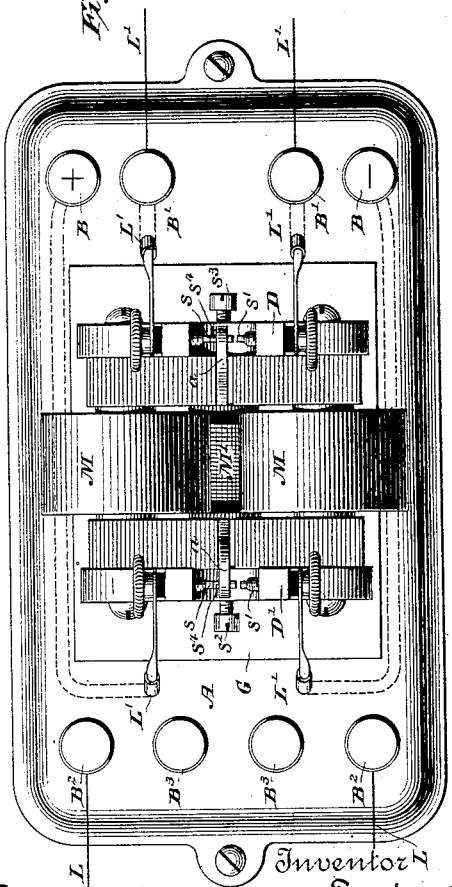

Fig. 3.

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UNITED STATES PATENT OFFICE.

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ELECTRIC TELEGRAPHIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 454,338, dated June 16, 1891.

Application filed January 12, 1891. Serial No. 377,490. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL VAN BUREN ESSICK, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have made a new and useful Invention in Electric Telegraphic Apparatus, of which the following is a specification.

My invention is directed particularly to improvements in telegraphic apparatus for use in main-line circuits wherein impulses are sent over the line in the nature of alternating or reversed currents; and its objects are, first, to provide an apparatus which shall be delicate in its operation, and therefore adapted to readily respond to all impulses, however delicate, transmitted over the line; second, to provide an apparatus which shall perform the double function of a relay and a repeater; and, third, to accomplish the several functions attributable to the apparatus hereinafter described.

To this end my invention consists in the apparatus hereinafter described, but particularly pointed out in the claims which follow this specification.

In order that my invention may be more fully understood, reference is had to the accompanying drawings, in which like letters of reference represent like parts wherever used.

Figure 1 is a side elevational view of my improved apparatus, shown partly in section. Fig. 2 is a transverse sectional view, shown partly in elevation, as seen looking from the right to the left of the sheet toward Fig. 1. Fig. 3 is a plan view of the entire apparatus. Fig. 4 is a diagrammatic view showing the circuit-connections, both local and main.

A represents the base of the instrument, of wood, vulcanized rubber, or similar material, and G is a metallic base, which carries the side standards D D′, adapted to support the magnet-coils M M′, the former being main-line coils provided each with a pair of internally-projecting pole-pieces, between which is located a two-armed vibratory armature *a*, said arms being of magnetic material integral with a magnetic core-piece C, pivotally secured between the standards D D′ by adjusting-screws s^2 s^3, as clearly shown in Figs. 1 and 2. The coil M′, which surrounds the core C, is of low resistance and is included in circuit with a local battery B^4, having its opposite poles connected to the binding-posts B^3 B^3 by a conductor L^2, as clearly shown in Fig. 2.

B^5 represents an additional local battery having its opposite poles connected by conductors L′ to the vibratory arms *a a*, which are insulated from each other, but provided with pole-changing contact-points s^4, adapted to contact on opposite sides with the adjustable stationary contact-screws *s s* and *s′ s′*, the contacts being made through binding-posts B B and B′ B′, and *w* and *w′* are conductors, which connect the contact-screws *s s′* and *s′ s* diagonally, as shown.

R represents a polar receiver of well-known form, either a relay or an apparatus designed for controlling printing telegraphic receivers or analogous devices.

The operation of the apparatus is as follows: Currents of reversed direction are transmitted over the main line L from the battery at the distant station by a pole-changer or equivalent device in a manner well understood by those skilled in the art, and these currents pass through the binding-posts B^2 B^2 to main-line coils M M to the earth at E. The polarity of the pivoted core C is maintained constant by virtue of the action of the local battery B^4, and it will therefore be understood that the reversals of the current through the main-line coils M will cause the polarized armature-arms *a a* to vibrate back and forth continuously as long as reversed currents are sent over the line. On examination of Fig. 4 it will, therefore, be seen that when the armature is in the position indicated the current of the local battery B^5 will pass to the receiver R by conductor L′, movable contact s^4 on the right, stationary contact *s* on the right, conductor L′, polar-receiver R, conductor L′ to earth at E′, through the earth to the second earth E′ by conductor L′ to the left-hand stationary contact-screw *s*, through the left-hand movable contact s^4, conductor L′, back again to the negative pole of the battery. When the pivoted arms *a a* assume their reversed positions, so that the movable contacts s^4 s^4 are resting against the fixed contacts *s′ s′*, the current from the local battery B^5 will pass to the receiver in a reverse direction, as follows: By the conductor L′, movable contact s^4 on the right, fixed contact *s′* on the right, the cross-conductor *w* to the upper fixed contact-

screw *s* on the left-hand side to conductor L′, earth E′ to the second earth at E′, conductor L′, receiver R, conductor L′ to the fixed contact-screw *s* on the right, cross-conductor *w′* to the lower fixed contact-screw *s′* on the left, movable contact s^4 on the left, conductor L′, back to the negative pole of the battery. It will thus be seen that each reversal of the current through the main-line coils M causes a like reversal of the current from the local battery B^5 through the receiver R.

I am aware that main-line telegraphic apparatus has been heretofore devised in which a pivoted armature was permanently polarized by a local battery and caused to vibrate through the agency of main-line magnets effected by reversed currents from a main-line battery, and I make no claim to such a construction.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A polar telegraphic instrument consisting of a pair of main-line coils having oppositely-disposed core-poles at each end of said coils, in combination with a pivoted magnetic core carrying a pair of magnetic contacting arms located between the opposite poles of said main-line magnets, said pivoted core being permanently magnetized by a local coil included in a local-battery circuit, substantially as described.

2. A polar telegraphic instrument consisting of a pair of main-line coils having oppositely-disposed core-poles at each end, a single local-circuit coil included in a local-battery circuit, and a pivoted magnetic core-piece having a pair of magnetic arms provided with conducting-contacts at their upper ends, in combination with local-battery-circuit connections on both sides of said conducting-arms, substantially as described and shown.

3. A telegraphic receiving-instrument having a pair of main-line coils with oppositely-disposed poles, a pole-changer having a pair of magnetic arms, a pivoted magnetic core carrying said arms, and a local polarizing-coil for the pivoted core, said coil being included in a local-battery circuit, substantially as described.

4. An electro-magnetic pole-changer having a pair of coils in a main-line circuit, a second coil in a local circuit, and a pair of pole-changing arms carried by a pivoted core polarized by the local coil, substantially as described.

5. An electro-magnetic pole-changer having a pair of coils in a main-line circuit, a second coil in a local circuit, a pair of pole-changing arms carried by a pivoted core permanently magnetized by the local coil, and cross-connections between fixed contacts and movable contacts borne by the pole-changing arms, whereby a local-battery current may be successively reversed in direction, substantially as described.

6. A pole-changer consisting of main and local magnet-coils, a pivoted magnetic core permanently magnetized by the local coil, a pair of pole-changing arms borne by the pivoted core, a local battery, and electrical connections, substantially as described, whereby each reversal of the main-line current reverses the direction of the local-battery current.

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